

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
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Washington, D.C.20231
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in its capacity as elected Office

Date of mailing (day/month/year) 04 October 2000 (04.10.00)	
International application No. PCT/NZ00/00013	Applicant's or agent's file reference MF801779/142
International filing date (day/month/year) 11 February 2000 (11.02.00)	Priority date (day/month/year) 11 February 1999 (11.02.99)
Applicant WATSON, Russell et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

06 September 2000 (06.09.00)

☐ in a notice effecting later election filed with the International Bureau on:
2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer F. Baechler Telephone No.: (41-22) 338.83.38
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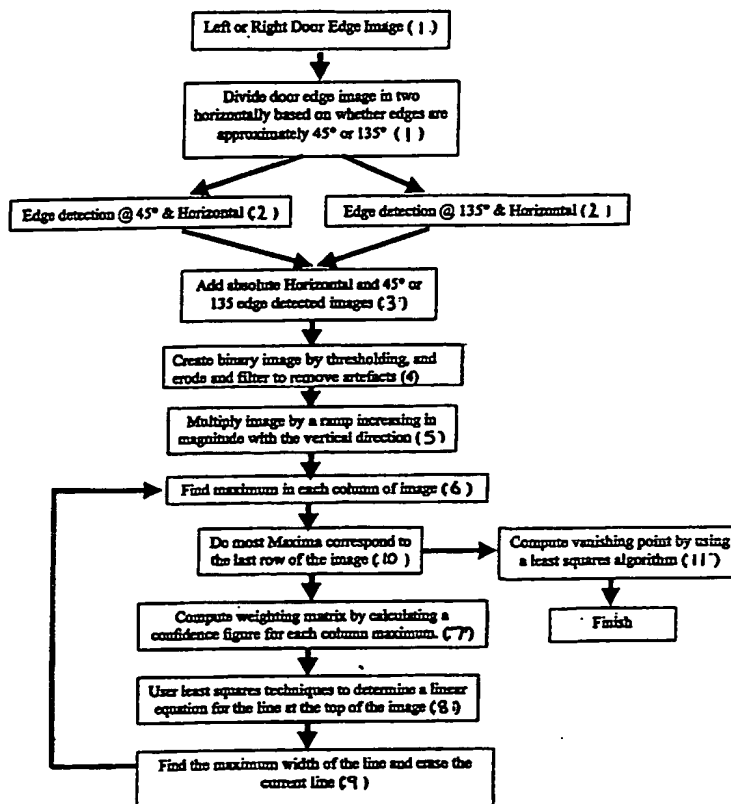
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : B66B 13/26		A1	(11) International Publication Number: WO 00/47511
			(43) International Publication Date: 17 August 2000 (17.08.00)
(21) International Application Number: PCT/NZ00/00013 (22) International Filing Date: 11 February 2000 (11.02.00) (30) Priority Data: 334144 11 February 1999 (11.02.99) NZ 502037 23 December 1999 (23.12.99) NZ (71) Applicant (for all designated States except US): TL JONES LIMITED [NZ/NZ]; 46b Halwyn Drive, Christchurch (NZ). (72) Inventors; and (75) Inventors/Applicants (for US only): WATSON, Russell [NZ/NZ]; 19 Birdwood Avenue, Beckenham, Christchurch (NZ). WOODHEAD, Ian [NZ/NZ]; McDurys Road, Ladbroke RD4, Christchurch (NZ). VISSCHEDIJK, Harrie [NL/NZ]; 45 Norwood Street, Beckenham, Christchurch (NZ). BURKITT, Dave [GB/NZ]; 63 Evesham Crescent, Spreydon, Christchurch (NZ). (74) Agents: HAWKINS, Michael, Howard et al.; Baldwin Shelston Waters, NCR Building, 342 Lambton Quay, Wellington (NZ).		(81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), DM, EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published With international search report.	

(54) Title: OBSTRUCTION DETECTION SYSTEM

(57) Abstract

The invention provides for a method of detecting objects in an area, the method including obtaining one or more images of the area, using an edge detection technique in such a way as to highlight substantially dominant linear features in the image(s), and determining if any dominant linear features intersect linear features defining the area. The method may also include detecting parallax in at least two images, the parallax being produced by the presence of 3-dimensional objects in the area.



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/NZ 00/00013

A. CLASSIFICATION OF SUBJECT MATTER					
Int Cl ⁷ : B66B 13/26					
According to International Patent Classification (IPC) or to both national classification and IPC					
B. FIELDS SEARCHED					
Minimum documentation searched (classification system followed by classification symbols) B66B 13/26					
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU: IPC as above					
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)					
C. DOCUMENTS CONSIDERED TO BE RELEVANT					
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.			
A	US 5387768 A (IZARD ET AL) 7 February 1995 entire document				
A	US 5182776 A (SUZUKI ET AL) 26 January 1993 entire document				
A	DE 19522760 A (DORMA GmbH & Co KG) 10 April 1997 entire document				
<div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex </div>					
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; vertical-align: top;"> <p>* Special categories of cited documents:</p> <p>"A" Document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </td> <td style="width: 33%; vertical-align: top;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p> </td> <td style="width: 33%;"></td> </tr> </table>			<p>* Special categories of cited documents:</p> <p>"A" Document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>	
<p>* Special categories of cited documents:</p> <p>"A" Document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>				
Date of the actual completion of the international search 28 April 2000		Date of mailing of the international search report 12 MAY 2000			
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200 WODEN ACT 2606 AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No.: (02) 6285 3929		Authorized officer D.G. FRY Telephone No.: (02) 6283 2130			

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/NZ 00/00013

Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Claims 1 and 35 define a method and apparatus which determines if dominant linear features intersect linear features defining the area. Claims 23 and 36 define the step of detecting parallax in two or more images of an area. There is no common special technical feature. The specification at page 40 lines 8-15 indicates such features are different.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/NZ 00/00013

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member				
US	5387768	MX 9306642	EP 595550	JP 6256535	US 5378997	BR 9304342
		MX 9306643	EP 595561	JP 6263887	US 5389178	BR 9304343
		GB 2272121	EP 600597	JP 7015245		
US	5182776	CN 1054844	GB 2243906	HK 1502/95	JP 3256934	JP 3264478
DE	19522760	NONE				

CLAIMS

1. A method of detecting objects in an area, the method including obtaining one or more images of the area, using an edge detection technique in such a way as to highlight substantially dominant linear features in the image(s), and determining if any dominant linear features intersect linear features defining the area.
5
2. A method of detecting objects in an area as claimed in claim 1 wherein the area is an object detection zone, the area being separated into at least two zones; a primary zone, being the volume described by a door and a door sill; and a secondary zone, which may include the volume beyond the door through which a person using the door would pass.
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3. A method of detecting objects in an area as claimed in claim 2 wherein primary zone is the door(s) and sill of an elevator and secondary zone is the landing/lobby where passengers may wait for the elevator.
15
4. A method of detecting objects in an area as claimed in any one of claims 1 to 3 wherein there are at least two images and the method includes a further step of detecting parallax in the two or more images, the parallax being produced by the presence of an object in the area, more specifically in the secondary zone.
20
5. A method of detecting objects in an area defined by a door and/or sill, said method including using edge detection techniques in such a way so as to highlight the substantially dominant linear features in an image or image(s), and determining if any dominant linear features intersect linear features defining said door and/or sill.
25
6. A method of detecting objects in an area as claimed in claim 5 wherein the method includes a preliminary stage of characterising one or more images to establish the presence of any characteristic linear features in the area, said
30

characteristic linear features are lines defining the door edges and/or sill and the location of said features is stored for future reference.

- 5 7. A method of detecting objects in an area as claimed in claim 5 wherein the method also includes an operational stage which analyses one or more images to establish the presence of any uncharacteristic features in the volume, said uncharacteristic features representing potential object and/or obstructions in the area.
- 10 8. A method of detecting objects in an area as claimed in claims 6 or 7 wherein the preliminary stage includes at least two steps, a first step of detecting the location and dimensions of a door sill and a second step of detecting the location and dimensions of one or more door edge(s).
- 15 9. A method of detecting objects in an area as claimed in claim 8 wherein the first step includes:
using substantially horizontal and/or substantially vertical edge
detection filters to highlight the dominant vertical and/or horizontal
lines in the part of the image where the sill is known to be
20 approximately located; summing the intensity values along each row of
pixels in the image(s) produced using the vertical and/or horizontal edge
detection filters thus producing a vertical and/or horizontal function
with maxima and/or minima corresponding to the position of horizontal
linear features and/or vertical linear features, said linear features
25 defining the spatial location of the door sill in terms of horizontal and
vertical features in the image.
- 30 10. A method of detecting objects in an area as claimed in claim 8 or claim 9 wherein the second step includes:
using knowledge of the spatial location of the sill and knowledge of the
physical relationship between the sill and the door edge(s) to obtain a
sub-image or sub-images of the door(s);

subjecting the sub-image(s) to edge detection filters adapted to highlight edges oriented at angles which lie between some known bounds;

manipulating the sub-image(s) to produce a binary image(s), the binary image(s) consisting of one of more linear features corresponding to the door edges; and

deriving equations for the linear features in the binary image(s).

11. A method of detecting objects in an area as claimed in claim 10 wherein the known bounds are substantially vertical and substantially horizontal edges.
12. A method of detecting objects in an area as claimed in claim 10 or 11 wherein prior to deriving equations for the linear features in the binary image(s) the second step may also include:
- manipulating the binary image by a ramp function which increases in magnitude in the vertical direction;
- further manipulating the images to clearly identify any dominant linear features in the binary image(s), the manipulation including applying a first filter to remove any substantially isolated features in the binary image(s), and applying a second filter to the binary image(s) to thin any substantially linear features in the image(s).
13. A method of detecting objects in an area as claimed in any one of claims 10 to 12 wherein the equations of the linear features are obtained by locating the line(s) by means of a least squares, or similar, technique; if there is more than one dominant linear feature in the image(s), once the equation for any one linear feature has been determined, that linear feature is removed from the image and the next dominant linear feature equated.
14. A method of detecting objects in an area as claimed in any one of claims 10 to 13 wherein a total weighting means is used to manipulate an estimate of the equation for each linear feature, thereby improving the confidence of the

equation for that linear feature, the total weighting means being found by normalising, and if necessary multiplying, one or more of:

a first weighting means, wherein the derivative and variance of a linear feature are determined, changes in the derivative and distance of points of the feature which are outside a given parameter representing breaks in the feature, the first weighting means down weighting or eliminating said points from the estimate; and/or

a second weighting means, wherein points in a linear feature further away from the image capture source are given a higher weighting than points in the same feature which are closer to the image capture source; and/or

a third weighting means, wherein the third weighting means is the inverse of the derivative of the feature; and/or

a fourth weighting means, wherein linear features which do not span any sub-image from vertical edge to vertical edge are weighted.

15. A method of detecting objects in an area as claimed in any preceding claim wherein the edge detection may be effected by means of filters, differentiators and the like.

16. A method of detecting objects in an area as claimed in any preceding claim wherein said edge detection is aimed at highlighting dominant lines orientated substantially horizontal, vertical and substantially diagonal, more particularly the diagonal lines are at substantially 45° and 135°, in the image(s).

17. A method of detecting objects in an area as claimed in claim 7 wherein the operational stage includes the steps of:

capturing one or more real time operational images of the area;

detecting the position of a door or doors in the image(s);

detecting the presence of objects in the area of the image(s) representing a sill; and

detecting the presence of objects in the area of the image(s) representing the door edges.

18. A method of detecting objects in an area as claimed in claim 17 wherein the position of the doors is obtained by detecting the intensity change in the substantially horizontal features of the sill where the intensity changes define the spatial location of the door(s) in the image(s).
5
19. A method of detecting objects in an area as claimed in claim 17 wherein the presence of objects in the area of the image representing the sill is determined by at least using a substantially vertical edge detection filter to highlight predominately vertical features in the image which intersect the linear features of the sill.
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20. A method of detecting objects in an area as claimed in claim 17 wherein the presence of objects in the area of the image representing the door edges is determined by at least using an edge detection filter to highlight predominate features in the image which intersect the linear features of the door.
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21. A method of detecting objects in an area as claimed in any one of claims 17 to 20 wherein the operational step includes converting the edge detected image(s) to a histogram or histograms wherein peaks in the histograms represent features in the image(s), said features representing the door(s) and/or sill, and/or an obstruction or obstructions on the door edge(s) and/or sill.
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22. A method of detecting objects in an area as claimed in any one of claims 17 to 21 wherein the operational stage may be repeated a plurality of times.
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23. A method of detecting objects and/or movement in objects, the method including the step of detecting parallax in two or more images of an area, the parallax produced by the presence of an object in the area.
30
24. A method as claimed in claim 23 the method including the step of detecting temporal changes in the images of the area.

25. A method as claimed in claim 23 and 24 wherein the method includes the step of detecting vertical and horizontal parallax produced by an object located in the area.
- 5 26. A method as claimed in claim 25 including the steps of aligning backgrounds of a plurality of images of an area and subtracting pairs of images so as to reveal, by way of parallax, the presence of objects in the area.
- 10 27. A method as claimed in claim 23 or claim 26 wherein the method of detecting objects includes the steps of aligning backgrounds of a first and second image of an area and subtracting the first image from the second, thereby revealing, by way of parallax, the presence of a three dimensional object.
- 15 28. A method as claimed in claim 23, 26 or 27 wherein the method includes the steps of:
- collecting a first image of an area from a first viewing point;
 - collecting a second image of an area from a second viewing point;
 - calculating the shift between the backgrounds of the two images;

20 aligning the backgrounds of the two images;

 - subtracting the two images to produce a third difference image;
 - analysing the third difference image to detect parallax thereby revealing the presence of a 3-dimensional object in the area.
- 25 29. A method as claimed in claim 28 wherein following the subtraction step, and before the analysing step, there is a thresholding step whereby the difference image is thresholded to exclude noise thus producing a binary image.
- 30 30. A method as claimed in claims 28 or 29 wherein the third difference image is manipulated so as to contain substantially only the outlines of any 3-dimensional objects in the area.

31. A method as claimed in any one of claims 28 to 30 wherein the images are divided into background images and door edge images wherein calculation of the necessary shift between the backgrounds of the two images is based on the images of the background when no object is present.

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32. A method as claimed in any one of claims 28 to 31 wherein the shift is calculated using cross-correlation.

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33. A method as claimed in any one of claims 28 to 32 wherein the images are blurred with gaussian, median or similar filters so as to reduce the effect of pixelation in the images.

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34. An apparatus for detecting objects in an area, said apparatus including at least one imaging means and a microprocessor apparatus adapted to carry out the method as claimed in any preceding claim.

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35. An apparatus for detecting objects in an area, the apparatus including:
at least one imaging means adapted to image the same scene from at least two spatially separate viewing points; and
microprocessor apparatus adapted to manipulate said images in such a way as to highlight substantially dominant linear features in said images and determine if any dominant linear features signify the presence of an object in the area.

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36. An apparatus for detecting objects in an area, the apparatus including:
at least one imaging means adapted to image substantially the same scene from at least two spatially separate viewing points; and
microprocessor apparatus adapted to manipulate said images in order to calculate the shift between the backgrounds of the two images or pairs of images, align the background images based on said shift, subtract the resulting images to produce a difference image thereby allowing the detection of parallax effects in the difference image thus signifying the presence of an object in the area.

30

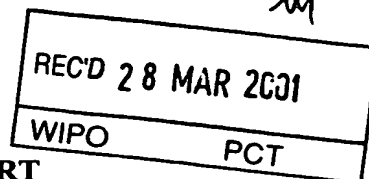
37. An apparatus for detecting objects in an area as claimed in claim 34 to 36 wherein the microprocessor is also adapted to manipulate the image or images to highlight substantially dominant linear features of the image(s).
- 5 38. An apparatus for detecting objects in an area as claimed in any one of claims 34 to 37 wherein the images may be manipulated optically, mathematically or in a like manner which reveals dominant linear features and/or parallax in the image(s) of the area.
- 10 39. An apparatus for detecting objects in an area as claimed in any one of claims 34 to 38 wherein the microprocessor is further adapted to threshold the image(s).
- 15 40. An apparatus for detecting objects in an area as claimed in any one of claims 33 to 39 wherein the microprocessor may be in the form of a solid state, optical or the like device.
- 20 41. An apparatus for detecting objects in an area as claimed in any one of claims 34 to 40 wherein a single camera is used and the apparatus includes an optical arm and reflection means adapted to relay an image from a viewing point that is displaced from the physical location of the camera.
- 25 42. An apparatus for detecting objects in an area as claimed in any one of claims 34 to 41 wherein the collection of two or more images may be effected by optical means including prisms, coherent optical fibre guides, and the like or alternatively the imaging means themselves may be translated or suitably displaced.
- 30 43. An apparatus for detecting objects in an area as claimed in any one of claims 34 to 42 wherein there may be artificial features added to aid the microprocessor in highlighting substantially normal dominant features of the image(s).

44. An apparatus for detecting objects in an area as claimed in any one of claims 34 to 42 wherein there may also be an input means, the input means enabling a user to input the location of normal dominant features into the microprocessor.
- 5

11

PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference MF801779/142	FOR FURTHER ACTION .	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. PCT/NZ00/00013	International Filing Date (<i>day/month/year</i>) 11 February 2000	Priority Date (<i>day/month/year</i>) 23 December 1999
International Patent Classification (IPC) or national classification and IPC Int. Cl. ⁷ B66B 13/26		
Applicant T L JONES LIMITED et al		

1.	This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.																
2.	<p>This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheet(s).</p>																
3.	<p>This report contains indications relating to the following items:</p> <table><tr><td>I</td><td><input checked="" type="checkbox"/> Basis of the report</td></tr><tr><td>II</td><td><input type="checkbox"/> Priority</td></tr><tr><td>III</td><td><input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td></tr><tr><td>IV</td><td><input checked="" type="checkbox"/> Lack of unity of invention</td></tr><tr><td>V</td><td><input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td></tr><tr><td>VI</td><td><input type="checkbox"/> Certain documents cited</td></tr><tr><td>VII</td><td><input type="checkbox"/> Certain defects in the international application</td></tr><tr><td>VIII</td><td><input type="checkbox"/> Certain observations on the international application</td></tr></table>	I	<input checked="" type="checkbox"/> Basis of the report	II	<input type="checkbox"/> Priority	III	<input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	IV	<input checked="" type="checkbox"/> Lack of unity of invention	V	<input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	VI	<input type="checkbox"/> Certain documents cited	VII	<input type="checkbox"/> Certain defects in the international application	VIII	<input type="checkbox"/> Certain observations on the international application
I	<input checked="" type="checkbox"/> Basis of the report																
II	<input type="checkbox"/> Priority																
III	<input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability																
IV	<input checked="" type="checkbox"/> Lack of unity of invention																
V	<input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement																
VI	<input type="checkbox"/> Certain documents cited																
VII	<input type="checkbox"/> Certain defects in the international application																
VIII	<input type="checkbox"/> Certain observations on the international application																

Date of submission of the demand 7 September 2000	Date of completion of the report 20 March 2001
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer D.G. FRY Telephone No. (02) 6283 2130

I. Basis of the report

1. With regard to the elements of the international application:*
- ☒ the international application as originally filed.
- ☐ the description, pages , as originally filed,
 pages , filed with the demand,
 pages , received on with the letter of
- ☐ the claims, pages , as originally filed,
 pages , as amended (together with any statement) under Article 19,
 pages , filed with the demand,
 pages , received on with the letter of
- ☐ the drawings, pages , as originally filed,
 pages , filed with the demand,
 pages , received on with the letter of
- ☐ the sequence listing part of the description:
 pages , as originally filed
 pages , filed with the demand
 pages , received on with the letter of
2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language which is:
- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).
3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, was on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished
4. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.
5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
- ☒ not complied with for the following reasons:

Claims 1 and 35 define a method and apparatus which determines if dominant linear features intersect linear features defining the area. Claims 23 and 36 define the step of detecting parallax in two or more images of an area. There is no common special technical feature between these claims. The specification at page 40 lines 8-15 indicates such features are different.

Thus the application is not directed to one invention only.

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
- ☐ the parts relating to claims Nos.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims 1 - 44	YES
	Claims	NO
Inventive step (IS)	Claims 1 - 44	YES
	Claims	NO
Industrial applicability (IA)	Claims 1 - 44	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)NOVELTY (N)INVENTIVE STEP (IS)

US 5387768

US 5182776

DE 19522760

These citations of the Search Report are "A" category documents only, which disclose the general state of the art.

The first two documents are discussed at pages 2 and 3 of the present specification.

Specifically there is no disclosure in these documents, either individually or in any obvious combination, of the method of detecting objects by determining if any dominant linear features intersect linear features defining the area as set out in Claims 1 and 35, or the method of detecting parallax in two or more images of an area as set out in Claims 23 and 36.

Thus, the invention satisfies the requirements for novelty and inventive step.

INDUSTRIAL APPLICABILITY

The invention set out in the claims of this application satisfies the requirements for this criteria.